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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,184	08/21/2006	Lilla Boroczky	US040135	1820

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EXAMINER	
PATEL, NIRAV G	
ART UNIT	PAPER NUMBER
4182	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,184	BOROCZKY ET AL.	
	Examiner	Art Unit	
	Nirav G. Patel	4182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *21 August 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

It would be of great assistance to the Office if all incoming papers pertaining to a filed application carried the following items:

1. Application number (checked for accuracy, including series code and serial no.).
2. Group art unit number (copied from most recent Office communication).
3. Filing date.
4. Name of the examiner who prepared the most recent Office action.
5. Title of invention.
6. Confirmation number (See MPEP § 503).

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed August 21, 2006 complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. It has been placed in the application file, and the information referred to therein has been considered as to the merits.

Claim Objections

3. Claim 18 is objected to because of the following informalities: Claim 18 currently reads as "A method as recited in claim 16" when it should be "An apparatus as recited in claim 16" due to claim 16 being directed to an apparatus. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 and 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "particular value" in claims 1, 5, and 6 is a relative term which renders the claim indefinite. The term "particular value" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. This renders determining plurality of metric values in a region near at least one pixel indefinite.

The term "metric values are UMDVP values" in claim 4 is a relative term which renders the claim indefinite. The term "metric values are UMDVP values" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. There is no clear definition of what an UMDVP value is, allowing an individual to claim that any value can be considered an UMDVP value.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 through 6, 8, 10, and 16, 17, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et al. ("*A New Enhancement Method for Digital Video Applications*," "Yang").

1) Regarding Claim 1, Yang discloses a method of reducing ringing artifacts in a compressed digital video signal, the method comprising:

decoding the coded video signal (Figure 7: A MPEG-2 decoder is used to decode video);

determining plurality of metric values in a region near at least one pixel (Page 438 Col. 1, Lines 11 – 13: UME values are calculated near at least one pixel), wherein the metric values are greater than a particular value; and

applying a deringing method to substantially reduce ringing artifacts near the pixel (Page 441 Col. 1, Lines 14 – 20: the UME-controlled sharpness enhancement algorithm (deringing) enhances the sharpness without boosting the coding(ringing) artifacts as shown in Figure 14(c)).

2) Regarding Claim 2, Yang discloses a method wherein the pixel is near or at an edge of an image of a frame (Figure 3: pixels near the edge of the image (Calendar numbers 5 &6) are the pixels of interest for algorithm).

3) Regarding Claim 3, Yang discloses a method wherein the plurality of metric values is for pixels near a strong edge of the image (Figure 3: metric values are

calculated for pixels near a strong edge (Calendar numbers 5 &6 and surrounding pixels are of interest for algorithm).

4) Regarding Claim 4, Yang discloses wherein the metric values are UMDVP values (Page 438 Col. 1, Lines 13 – 15: the pixel-based UME is calculated differently depending whether the frame is an I, P, or B frame which is a metric value)

Page 437 Col. 1, equation 1 gives a definition of UME as a function of q_scale, and num_bits and then is modified to include a variance term (Page 437 Col. 2, equation 2, lines 27 – 28: UME definition needs to be refined to get a metric that is adaptive to the local scene content). The UME values are then calculated depending on what type of frame it is, I, P, or B (Page 439 Col. 2, Lines 1 - 2: The final UME calculation is different depending on whether the frame is an I-frame, P-frame, or B-frame).Inventors define UMDVP as a value determined by parameters such as quantization scale, number of bits spent to code a block, and picture type (I, P, or B) in original specification (Page 4, Lines 30 – 31) which therefore equates UME with UMDVP for the purpose of this action.

5) Regarding Claim 5, Yang discloses wherein artifacts are localized for deringing by counting the number of UMDVP values greater than the particular value in a window around a pixel that is to be deringed (Page 438, Col. 1, Lines 13 – 17: To achieve optimal results, in addition to calculating UME values, motion is estimated so that artifacts can be localized. Lines 25 - 29: a pre-determined search is conducted to find UME values which are a particular value).

6) Regarding Claim 6, Yang discloses wherein the number of UMDVP values greater than the particular value is compared to a threshold value that is proportional to a size of the window (Page 438 Col. 2, Lines 2 – 7: still_thred value is an empirically defined threshold value (particular) relating to a UME (UMDVP by equated in analysis in claim 4) within a search window).

7) Regarding Claim 8, Yang discloses deringing a luminance component of the decoded video signal (Page 437 Col. 2, Lines 30 – 33: one local spatial feature used in the algorithm is the variance of the luminance value for each pixel, which derings the video (Page 438 Col. 1, Lines 5 – 7).

8) Regarding Claim 10, Yang discloses after the deringing, updating metric data of a post-processed signal (Page 438 Col. 1, Equation (2') defines an updated value of the variance and ultimately the metric value).

9) Regarding Claim 16, Yang discloses an apparatus for selectively deringing a compressed digital video signal, comprising:

a decoding module (Figure 7: A MPEG-2 decoder is used to decode video);

a metric calculation module (Figure 8: A metric calculation module is shown to calculate the metrics for I frames); and

a metric-controlled deringing module, wherein the deringing module reduces ringing artifacts in certain regions of a video frame based on data from the metric calculation device (Figure 8: A peaking algorithm (deringing) controlled by the metric UME module (Figure 12)).

10) Regarding Claim 17, Yang discloses wherein the metric-controlled deringing module updates metric data of the frame based on the deringing (Figure 12: the algorithm takes an input of video data, applies the algorithm and produces an output which is updated containing metric data).

11) Regarding Claim 19, Yang discloses wherein the deringing module substantially reduces or eliminates ringing artifacts in selected regions of a frame (Page 441 Col. 1, Lines 15 – 16: The described algorithm enhances the subjective perception of sharpness but enhances artifacts, which is prevented by using the metric data to control the algorithm).

12) Regarding Claim 20, Yang discloses wherein the deringing module substantially reduces or eliminates ringing artifacts in selected regions of a frame (Page 441 Col. 1, Lines 15 – 16: The described algorithm enhances the subjective perception of sharpness but enhances artifacts, which is prevented by using the metric data to control the algorithm).

8. Claims 12 and 13 are rejected under 35 U.S.C. 102(a) as being anticipated by Kong et al. ("*Edge Map Guided Adaptive Post-Filter for Blocking and Ringing Artifacts Removal*", "Kong").

1) Regarding Claim 12, Kong discloses a method of reducing ringing artifacts in a compressed digital video signal, the method comprising:

determining an average of a metric from a plurality of metric values in selected regions of a frame (Page 4 Col. 1, Lines : statistics including the mean for pixels values

are calculated, which include metric data (Page 3 Col 2. Lines 24 - 25: map information and local statistics around edges)) ; and

applying a deringing method if the average metric in one of the selected regions is above a threshold (Lines 5 -8: blocks are classified according to metric information. Lines 14 – 16: the filter is applied to selected pixels which are classified as artifacts (above a value determined previously/threshold)).

2) Regarding Claim 13, Kong discloses decoding the digital video signal, before determining the average (Figure 3: Upper-left image shows decoded video frame which is then subjected to algorithm which determines average, the result shown in lower-right image).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang.

1) Regarding Claim 7, while Yang fails to teach the method is repeated for a plurality of regions in the frame. However, one of ordinary skill in the art at the time of the invention would repeat the deringing method for a plurality of regions in the frame so that all the ringing artifacts would be removed as the possibility of only one region of the

frame contains ringing artifacts is small. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to repeat Yang's method for a plurality of regions in the frame.

2) Regarding Claim 9, while Yang fails to teach deringing a chrominance component of the decoded video signal, he does teach deringing a luminance component of the decoded video signal, as shown in analysis of claim 8. When the video encoded in MPEG-2 is decoded, information of the chrominance and luminance is obtained as it is parts of the video. The method of deringing the luminance along with the present chrominance component would be obvious because if only the luminance was deringed, the result would not be optimal, as well known to one of ordinary skill in the art at the time of the invention.

3) Regarding Claim 11, Yang discloses after the deringing, updating metric data of a post-processed signal (Page 438 Col. 1, Equation (2') defines an updated value of the variance and ultimately the metric value).

11. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kong.

1) Regarding Claim 14, while Kong does not explicitly disclose deringing a luminance component of the decoded video signal, the method outlined would teach the limitation. Using the video signal and decoding it yields information such as the luminance of the frame due to the fact that these signals use standards such as NTSC which contain the luminance information. By applying Kong's deringing algorithm to the

frame, which contains the luminance component, the component is automatically deringed, as well known to one of ordinary skill in the art at the time of the invention.

2) Regarding Claim 15, while Kong does not explicitly disclose deringing a chrominance component of the decoded video signal the method outlined would teach the limitation. Using the video signal and decoding it yields information such as the chrominance of the frame due to the fact that these signals use standards such as NTSC which contain the chrominance information. By applying Kong's deringing algorithm to the frame, which contains the chrominance component, the component is automatically deringed, as well known to one of ordinary skill in the art at the time of the invention

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Kong.

1) Regarding Claim 18, Kong fails to teach the metric is a UMDVP metric. However, Yang discloses wherein the metric values are UMDVP values (Page 438 Col. 1, Lines 13 – 15: the pixel-based UME is calculated differently depending whether the frame is an I, P, or B frame which is a metric value)

Page 437 Col. 1, equation 1 gives a definition of UME as a function of q_scale, and num_bits and then is modified to include a variance term (Page 437 Col. 2, equation 2, lines 27 – 28: UME definition needs to be refined to get a metric that is adaptive to the local scene content). The UME values are then calculated depending on what type of frame it is, I, P, or B (Page 439 Col. 2, Lines 1 - 2: The final UME

calculation is different depending on whether the frame is an I-frame, P-frame, or B-frame).Inventors define UMDVP as a value determined by parameters such as quantization scale, number of bits spent to code a block, and picture type (I, P, or B) in original specification (Page 4, Lines 30 – 31) which therefore equates UME with UMDVP for the purpose of this action.

Using the UME metric defined by Yang in Kong's apparatus allows for improved performance of a sharpness enhancement algorithm for compressed digital video (dering). Using the metric also yields an optimal result void of artifacts which is the basis of Kong's apparatus. Therefore it would have been obvious to one of ordinary skill at the time of the invention to incorporate the teachings of Kong to Yang's.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirav G. Patel whose telephone number is (571)270-5812. The examiner can normally be reached on Monday - Friday 8 am - 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benny Tieu can be reached on 571-272-7490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nirav G. Patel/
Examiner, Art Unit 4182

/Benny Q Tieu/
Supervisory Patent Examiner, Art Unit 4182